

$$7.) -3x^2 + 5x = 9$$

(quadratic equation)

$$-9 \quad -9$$

(subtraction property of equality)

$$\hline -3x^2 + 5x - 9 = 0$$

(quadratic equation in standard form)

$$15.) 4x^2 - 13x + 3 = 0$$

$$1ST \quad a=4 \quad b=-13 \quad c=3$$

$$2nd \quad x = \frac{13 \pm \sqrt{(-13)^2 - 4(4)(3)}}{2(4)}$$

3rd

$$x = \frac{13 \pm \sqrt{169 - 48}}{8}$$

$$x = \frac{13 \pm \sqrt{121}}{8}$$

$$x = \frac{13 \pm 11}{8}$$

$$\frac{13+11}{8} = \frac{24}{8}$$

$$= 3$$

$$x = 3$$

$$\frac{13-11}{8} = \frac{2}{8}$$

$$= \frac{1}{4}$$

$$x = \frac{1}{4}$$

there are two roots for this quadratic equation

$$5.) y = x^2 + x - 2$$

$$0 = (x+2)(x-1)$$

$$a=1 \quad b=1 \quad c=-2$$

$$x = \frac{-1 \pm \sqrt{1^2 - 4(1)(-2)}}{2(1)}$$

$$= \frac{-1 \pm \sqrt{1+8}}{2}$$

$$= \frac{-1 \pm \sqrt{9}}{2}$$

$$\frac{-1 \pm 3}{2}$$

$$\frac{-1+3}{2} = \frac{2}{2} = 1$$

$$\frac{-1-3}{2} = \frac{-4}{2} = -2$$

$$(1,0) \text{ \& } (-2,0)$$

these are the x-intercepts for the parabola

$$17.) 2x^2 + 7x + 3 = 0$$

Quadratic
Formula

Way: $a=2$ $b=7$ $c=3$

$$x = \frac{-7 \pm \sqrt{(7)^2 - 4(2)(3)}}{2(2)}$$

$$= \frac{-7 \pm \sqrt{49 - 24}}{4}$$

$$= \frac{-7 \pm \sqrt{25}}{4}$$

$$\begin{array}{c} \frac{-7 \pm 5}{4} \\ \swarrow \quad \searrow \\ \text{on} \\ \frac{-7+5}{4} \quad \frac{-7-5}{4} = \\ \frac{-2}{4} = -\frac{1}{2} \quad \frac{-12}{4} = -3 \end{array}$$

two roots for the equation

$$17.) 2x^2 + 7x + 3 = 0$$

Completing the square method

$$2x^2 + 7x + 3 = 0$$

$$\frac{2x^2 + 7x}{2} = \frac{-3}{2}$$

$$x^2 + \frac{7}{2}x = -\frac{3}{2}$$

$$+ \left(\frac{7}{4}\right)^2 + \left(\frac{7}{4}\right)^2$$

$$x^2 + \frac{7}{2}x + \left(\frac{7}{4}\right)^2 = -\frac{3}{2} + \frac{49}{16}$$

$$\sqrt{\left(x + \frac{7}{4}\right)^2} = \sqrt{\frac{25}{16}}$$

$$x + \frac{7}{4} = \pm \frac{5}{4}$$

$$x = -\frac{7}{4} \pm \frac{5}{4}$$

$$x = -\frac{2}{4} = -\frac{1}{2} \text{ or}$$

$$x = -\frac{12}{4} = -3$$

$$19.) \quad 5y^2 + 2y - 2 = 0$$

$$a = 5$$

$$b = 2$$

$$c = -2$$

$$x = \frac{-2 \pm \sqrt{(2)^2 - 4(5)(-2)}}{2(5)}$$

$$x = \frac{-2 \pm \sqrt{4 + 40}}{10}$$

$$x = \frac{-2 \pm \sqrt{44}}{10}$$

now either simplify square root or round two decimal places

$$23.) \quad x^2 - 625 = 0$$

$$\quad \quad \quad +625 \quad +625$$

$$\sqrt{x^2} = \sqrt{625}$$

$$x = \pm 25$$

this is the square root method

$$17.) 2x^2 + 7x + 3 = 0$$

$$a=2 \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$b=7$$

$$c=3$$

$$x = \frac{-(7) \pm \sqrt{(7)^2 - 4(2)(3)}}{2(2)}$$

$$= \frac{-7 \pm \sqrt{49 - 24}}{4}$$

$$= \frac{-7 \pm \sqrt{25}}{4}$$

$$\rightarrow x = \frac{-7 \pm 5}{4}$$

$$x = \frac{-7+5}{4} \text{ OR } x = \frac{-7-5}{4}$$

$$= \frac{-2}{4} = \frac{1}{2}$$

$$x = \frac{-12}{4}$$

$$x = -3$$

$$\frac{6 \pm \sqrt{8}}{2} = \frac{6 \pm \sqrt{4} \sqrt{2}}{2} = \frac{6 \pm 2\sqrt{2}}{2}$$

$$\cancel{\frac{2(3 \pm \sqrt{2})}{2}} = 3 \pm \sqrt{2}$$

$$\begin{aligned} 6 + 2 &= \\ 2(3 + 1) & \\ \text{or} & \\ 6 - 2 &= \\ 2(3 - 1) & \end{aligned}$$

Completing the Square

$$\frac{4x^2}{4} + \frac{4x}{4} + \frac{1}{4} = 0$$

$$x^2 + x + \frac{1}{4} = 0$$

$$\begin{array}{r} x^2 + x \\ \hline \end{array} \quad \begin{array}{r} -\frac{1}{4} \quad -\frac{1}{4} \\ \hline \end{array}$$

$$\begin{array}{r} x^2 + x + \left(\frac{1}{2}\right)^2 \\ \hline \end{array} \quad \begin{array}{r} = -\frac{1}{4} + \left(\frac{1}{2}\right)^2 \\ \hline \end{array}$$

$$x^2 + x + \left(\frac{1}{2}\right)^2 = -\frac{1}{4} + \frac{1}{4}$$

$$\sqrt{\left(x + \frac{1}{2}\right)^2} = \sqrt{0}$$

$$x + \frac{1}{2} = 0$$

$$\begin{array}{r} -\frac{1}{2} \quad -\frac{1}{2} \\ \hline \end{array}$$

$$x = -\frac{1}{2}$$

$$20.) \quad 2x^2 + 4x - 3 = 0$$

$$x = \frac{-4 \pm \sqrt{(4)^2 - 4(2)(-3)}}{2(2)}$$

$$x = \frac{-4 \pm \sqrt{16 + 24}}{4}$$

$$x = \frac{-4 \pm \sqrt{40}}{4} \approx 0.58 \text{ or } -2.58$$

$$24.) \quad 4a^2 - 49 = 0$$

$$+49 \quad +49$$

$$\frac{4a^2}{4} = \frac{49}{4}$$

$$\sqrt{a^2} = \frac{\sqrt{49}}{\sqrt{4}}$$

$$a = \pm \frac{7}{2}$$